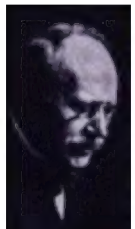


A Thumbnail History of Electronics

II. Wireless Telegraphy

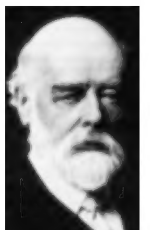
Maxwell's 1865 publication of a theory which unified electrodynamics, magnetodynamics, and optics had seemingly little impact in Britain where it was not widely accepted. Surprisingly, during the remaining fourteen years of his life, Maxwell, who was a skillful experimentalist, did not attempt to verify the existence of the electromagnetic waves that his theory predicted. However, the leading German scientist of the period, von Helmholtz, believed the Maxwell theory and he set his pupil Hertz on the track of producing and detecting electromagnetic radiation, opening the path to wireless communication.

Heinrich Rudolf Hertz (1857-1894), a professor of physics at Karlsruhe Polytechnic, was the first to broadcast and receive radio waves in the laboratory. Between 1885 and 1889, he used spark discharges to produce electromagnetic waves. Hertz's radiator consisted of a pair of aligned rods, with a spark gap between them and capacitive plates at their ends. His receiver was a loop of wire with a small gap across which a small spark could be observed when the radiator discharged. Hertz died suddenly of a brain tumor when he was thirty six, perhaps never realizing that transmission and reception over long distances was possible.



Edouard Eugène Désiré Branly (1844-1940) is revered in France as the inventor of wireless telegraphy. In 1890, Branly, a professor of Physics at the Catholic University of Paris, discovered that when exposed to even a distant spark transmission field, loose zinc and silver filings would cohere and provide a path of increased conductivity that could be used to detect the presence of the transmission. The "coherer" took radio transmission out of the laboratory and made communication over long distances possible.

Oliver Joseph Lodge (1851-1940) held the chair in Physics at the University College in Liverpool when he demonstrated a practical form of the Branly coherer in 1894. Lodge added a device that shook the filings loose between spark receptions. It became a standard device in early wireless telegraphy. Lodge also obtained the first patents for the use of tuned circuits to adjust the frequency of receivers and transmitters. After 1900, however, Lodge devoted himself to psychic research and attempts to communicate with the dead. In 1902 he was appointed the first principal of the new Birmingham University.



Guglielmo Marconi (1874-1937) failed the entrance exams to the Italian Naval Academy and the University of Bologna but was allowed by a family friend to attend lectures and laboratory at the university. In 1896, at age twenty-two, he patented a successful system of radio telegraphy. In the following years he introduced a notable series of inventions and ingenious redesigns of transmitting and receiving system components. In 1901 Marconi



succeeded in receiving signals transmitted across the Atlantic Ocean. It may be fairly said that Marconi single-handedly advanced the development of radio telegraphy by decades. Marconi's Wireless Telegraphy Company soon established a net of coast stations in Britain for ship-to-shore communication. These were taken over by the British General Post Office in 1910, but for more than a decade the Marconi Company enjoyed a monopoly on maritime radio equipment sales by virtue of an agreement with Lloyds of London to only insure ships that used their equipment. In 1909 Marconi received the Nobel Prize for Physics.



[Return to "Contents"](#)

[Next](#)

